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| Zhytomyr Polytechnic State University Mining and Environmental Faculty Specialty: 101 "Ecology" and  183 “Environmental protection technologies” Educational and qualification level: Master | |
| "Approved"  Pro-rector  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ А.V. Morozov  «\_\_\_\_» \_\_\_\_\_\_\_\_ 2019 р. | Approved at the meeting of the Department of Ecology, Protocol No. 8 of "28" August, 2018  Head of the Department \_\_\_\_\_\_\_\_\_I.G. Kotzuba  «\_\_\_\_» \_\_\_\_\_\_\_\_ 2019 р. |

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| № | Text of the tasks |
|  | Tests tasks  Research methodology and organization |
| 1. Questioning approaches | |
| 1. | Project management means: |
| 2. | A research proposal includes: |
| 3. | Project management means: |
| 4. | Asking the right question is crucial for effective communications and information exchange: |
| 5. | Handling project budgets means: |
| 6. | Good team leading is: |
| 7. | You need to be able to handle large amounts of data: |
| 8. | As a scientist you need to be: |
| 9. | Lose any work/data due to incompetence or disorganization: unacceptable: |
| 10. | How to organize folders and files?: |
| 11. | For a scientist IT skills are: |
| 12. | When you running of your own research project you need to be an IT expert: |
| 13. | When you running of your own research project you need to learn new methods or packages: |
| 14. | Scientists see the world differently than we do: |
| 15. | Scientists analyze problems: |
| 16. | Theories are the result of: |
| 17. | The ability to create / generate new ideas and new connections between ideas, and ways to solve problems (in science): |
| 18. | The study of ecology is all about: |
| 19. | Many topics/questions in ecology sound equally: |
| 20. | Picking and developing a good research topic / question is: |
| 21. | The question you pick should reflect your goals: |
| 22. | By doing research you will: |
| 23. | By doing research you will learn yourself how to write: |
| 24. | All projects have to be: |
| 25. | Looking at the world around you, means: |
| 26. | Draw conclusions from your data means: |
| 27. | Is novelty always on the first place?: |
| 28. | An original research produces: |
| 29. | “Perfectionism” - one of the: |
| 30. | “Small” (specific) questions (little replications) is: |
| 31. | If the pilot study results turn out as expected, you: |
| 32. | Project feasibility meaning: |
| 33. | You should feel fortunate if: |
| 34. | The research project feasibility means: |
| 35. | By starting with a system you will find  yourself in search of: |
| 36. | While you are answering one question, you are likely to see other ones: |
| 37. | Approaches (broad) in Ecology: |
| 38. | Theoretical approach deals with: |
| 39. | Empirical approach trying to understand how the natural world works at the level of: |
| 40. | An applied ecologist: |
| 41. | Observation of patterns provide us with: |
| 42. | Observation allow us to generate hypotheses and to test models: |
| 43. | Observation of patterns is an manipulative experiment: |
| 44. | Keeping a field notebook may help you with observations: |
| 45. | To observe and quantify a pattern in nature is an excellent way to begin an experiment: |
| 46. | Some ecological processes are simply hard to manipulate in any realistic way: |
| 47. | Important ecological processes often occur at: |
| 48. | In an manipulative experiment an experimenter controls variable(s): |
| 49. | Observation of patterns can be applied to test hypothese: |
| 50. | Observation of patterns can helps to establish causality: |
| 51. | Manipulative experiment can help to establish causality: |
| 52. | The strengths of modeling is that it applies to many systems and allows us to identify the important elements: |
| 53. | General models help us to formulate the logical links between variables: |
| 54. | Specific models help us develop new hypotheses about how nature works: |
| 55. | The investigator disturbs the system and can: |
| 56. | General models allows us to make prediction: |
| 57. | Correlation alone implies causation: |
| 58. | Correlations can resolve which of the two correlated variables might have caused the other: |
| 59. | Intuition to design experiments is better provided by: |
| 60. | Experiments are limited by: |
| 2. Design of experiment and testing a hypothesis | |
| 61. | Experiments in ecology are: |
| 62. | Comparative experiments mean: |
| 63. | Factors that affect the choice of experimental design: |
| 64. | An experimental unit is: |
| 65. | Experiment can simultaneously contain: |
| 66. | A factor may be: |
| 67. | If data has been gathered from all the levels of the factor that are of interest, it is: |
| 68. | If you increase the number of replicates you get: |
| 69. | Are there “real” replicates: one soil sample from one location, 200 analyses: |
| 70. | Are there “real” replicates: one soil sample from each of 10 locations, 20 analyses of each sample: |
| 71. | Are there “real” replicates: select 10 areas, 10 samples from each area, 2 analyses of each sample: |
| 72. | Are there “real” replicates: select 10 areas, 10 samples from each area (mix them in one), 2 analyses of each mixed sample: |
| 73. | A method based on chance alone by which study participants are assigned to a treatment group: |
| 74. | A sampling method used in scientific experiments: |
| 75. | Assume you just selected one field of two, is this random selection?: |
| 76. | We all have biases: even we are not allways conscious of them: |
| 77. | If there is an equal number of observations for each treatment combination, it is: |
| 78. | If some treatment combinations are missing the experiment is: |
| 79. | The treatments are assigned completely at random: |
| 80. | Subjects divided into subgroups (blocks), then, subjects within each block are randomly assigned to treatment conditions: |
| 81. | Very efficient designs, which allow two blocking factors: |
| 82. | Treatments / samples against which manipulations are compared: |
| 83. | Treatments / samples that remain the same or equal throughout the experiment: |
| 84. | Any differences in experimen may be due to: |
| 85. | Your ideas have to be formulated in to: |
| 86. | Before running experiments start with: |
| 87. | Statistical significance is indicated by: |
| 88. | Statistical significance at p < 0.05 means that: |
| 89. | Biological significance is indicated by: |
| 90. | Very small differences can be statistically significant: |
| 91. | From the view point of statistics a population is: |
| 92. | A representative sample is: |
| 93. | How to calculate effect size?: |
| 94. | Strictly speaking two populations are truly different if p =: |
| 95. | If p = 0.001 we can be more confident that the result was not caused by chance than if e.g. p =0.05: |
| 96. | If e.g. p > 0.05, should we conclude that two populations really are the same?: |
| 97. | Statistical tests give us far more power to: |
| 98. | The p value gives information about the likely size of any effect: |
| 99. | Unpaired data, are data: |
| 100. | A measure that is used to quantify the amount of variation or dispersion of a set of data values: |
| 101. | The standard deviation (often SD) is: |
| 102. | The null hypothesis is that the means in the two populations are the same: |
| 103. | ANOVA is: |
| 104. | ANOVA is used to: |
| 105. | In ANOVA we calculate: |
| 106. | The degrees of freedom is: |
| 107. | Communicating is an essential part of doing ecology: |
| 108. | The currency in the field of science are: |
| 109. | Scientific journals have: |
| 110. | Journal rankings reflect: |
| 111. | Original research: |
| 112. | Review article: |
| 113. | Meeting abstracts: |
| 114. | Journal’s format includes: |
| 115. | Title tells: |
| 116. | Title can be: |
| 117. | It is a good idea to use acronyms in the title without spelling them out: |
| 118. | Abstract provides a summary of the paper: |
| 119. | Title has to be: |
| 120. | Reviewers (critics) will make their conclusion about the paper based largely on the: |
| 3. Statistical approaches | |
| 121. | Variation that you can not explain makes difficult to interpret the data: |
| 122. | “Laws of nature” in biology / ecology are more complicated due to: |
| 123. | A parameter is a characteristic of a: |
| 124. | A statistics is a characteristic of a: |
| 125. | Inferential statistics enables you to make a guess about a: |
| 126. | A subset of a population is called a: |
| 127. | A sample is a set of data collected and/or selected from a population by a defined procedure: |
| 128. | A set of objects chosen from a complete sample using a selection process that does not depend on the properties of the objects is: |
| 129. | A sample where each individual member of the population has a known, non-zero chance of being selected as part of the sample is defined as: |
| 130. | A set of objects from a parent population that includes all such objects that satisfy a set of well-defined selection criteria is defined as: |
| 131. | In experiments, we: |
| 132. | The sample should be: |
| 133. | The researcher can: |
| 134. | Methods to draw conclusions about the population based on sample data, is called: |
| 135. | Descriptive statistics: |
| 136. | A quantitative (numeric) variable has: |
| 137. | Variables that can only take on a finite number of values: |
| 138 | A qualitative variable: |
| 139. | The sum of all observation, divided by the number of observations: |
| 140. | A statistical term that refers to the most frequently occurring number found in a set of numbers: |
| 141. | The middle value in a dataset, when the data are in ascending or descending order: |
| 142. | A measure of the “spread” of the observations: |
| 143. | The positive square root of the variance: |
| 144. | The ratio of the standard deviation to the mean: |
| 145. | The statistical parameter that is inversely proportional to the square root of the sample size: |
| 146. | Mean value, µ is: |
| 147. | A statement about a population parameter is: |
| 148. | The probability that the confidence interval captures the true population parameter: |
| 149. | A very common continuous probability distribution in statistics: |
| 150. | A statement about a population parameter is: |
| 151. | The t test is used to determine whether there is a significant difference between the means of two groups: |
| 152. | If calculated value is larger than the tabled value in t-table we: |
| 153. | The test that can be used to evaluate a relationship between two categorical variables: |
| 154. | Tests that look for an association between variables: |
| 155. | The data values belong together in pairs (“blocks”): |
| 156. | The decision of which statistical test to use depends on: |
| 157. | Nonparametric tests are used when: |
| 158. | A formal technique that relies on the probability distribution, for reaching the conclusion concerning the reasonableness of the hypothesis: |
| 159. | The test where the researcher has information about the population parameter: |
| 160. | The test where the researcher has no idea regarding the population parameter: |